

*M.D. 1913.*

THESIS ON THE  
HISTORY OF THE EVOLUTION OF  
OPERATIVE TREATMENTS OF RETRO-  
DISPLACEMENTS & PROLAPSES OF  
THE UTERUS, WITH SPECIAL RE-  
FERENCE TO MODERN TECHNIQUE.

The thesis is forwarded under the conditions  
of the OLD REGULATIONS.

*March 5. 1913.*



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## SECTION 1.

## ANATOMICAL NOTE.

Before considering the operative treatments for Uterine Displacements, a preliminary note is required on the normal position of the Uterus & the structures that retain it in that position. It is to be noted that the title of this thesis does not admit of any discussion on the anatomy or physiology of the organs. Those statements & deductions are presented by the writer, which, having been enunciated by well-known authorities, appear to her to be the most reliable. Where a much-argued point, with a good deal to say on either side, has to be stated, conflicting opinions have been quoted. Only as much anatomy & physiology have been referred to as will serve to give a clear & comprehensive grasp of the site the gynaecological surgeon has to work in, of the factors which go to form the complex mechanism he has to work on, & of the objects he will have to keep in view, in order to repair the mechanism after it has become faulty.

## THE UTERUS.

The Uterus is normally "anteflexed, anteverted, anteposed" <sup>7.1</sup>

It rests on the Pelvic Floor, & is elevated by the upward

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resisting pressure from the muscles composing it. It is maintained in comparative stability by the united forces of the lower muscular bands of the Broad & Utero-sacral Ligaments. By the action of the Utero-sacral Ligaments the tension on the Cervix is upwards & backwards, causing the Os Uteri to look towards the hollow of the Sacrum, & giving a forward tilt to the upper free portion of the Uterus, which thereby assumes the position of ANTEVERSION. By the action of the opposing Broad Ligaments, the upward pull on the Cervix is limited. The posterior surface of the Uterus comes to lie superiorly, & to receive the intra-abdominal pressure, by which the Uterine body is pressed down into a position of ANTEFLEXION, which position is helped by its own weight, by the Round Ligaments & by its connection with the bladder. The lower part of the anterior surface of the Uterus lies against the bladder, to which it is attached by loose connective tissue, & by the position of which it is influenced. When the conditions of the Pelvic Floor, Broad Ligaments & Utero-sacral Ligaments are normal, the upper part of the Cervix is a comparatively fixed point, acting as a pivot to the Uterine body which swings above it, & which responds to any impulse from the surrounding parts. A full bladder will reduce the antelexion, & full rectum will exaggerate it.



loaded intestines will push it down, & an impulse from the vagina send it up. The body generally has a twist, so that one cornu (more often the right) comes to lie somewhat anteriorly.

## THE SUPPORTING STRUCTURES.

### (1). The PELVIC FLOOR.

The Pelvic Floor consists structurally of a Fixed & a Displaceable Portion. The Fixed Portion is composed of a mass of muscle & fascia on either side; sweeping from pubis, fascia, sacrum & coccyx, downwards & backwards to meet the muscles of the opposite side at a ~~very~~ median point, on a lower plane. The Displaceable Portion is marked off by a circle of loose connective tissue, starting from the retro-pubic fat, travelling on the inner surface of the muscular mass & over the anterior surface of the rectum. The part divided off by this, contains the bladder, urethra & vaginal walls. The upper surface of the Fixed Portion, is concave & supports the Displaceable Portion, which in turn helps to support the abdominal & pelvic viscera. Between the two masses of muscle, lies the Uterus. The result of the united upward & inward pressures of the two shelving muscular walls of the pelvis, is a directly upward resistance against

the intra-abdominal pressure.

## (2)...THE BROAD LIGAMENTS.

The Broad Ligaments are two folds of serous membrane stretching from the sides of the Uterus, & supra-vaginal portion of the Cervix, across the pelvis on either side, & attached to the parietes rather posterior to the transverse diameter of the pelvis, & somewhat anterior to the Sacro-iliac joints. They are composed mainly of fibrous & elastic tissue, with a few muscle fibres, except in the lower parts where there is a strong muscular band inserted into the supra-vaginal part of the Cervix on either side:- the "Cardinal ligament" of Koch, or the "Transversalis Colli of Mackenrodt. Tweedy differentiates the Broad Ligament proper from the Transversalis Colli. The *raison d'être* of the former, in his mind, being to act as a framework to the vessels, & not to form a support to the Uterus - the Transversalis Colli, lying below the Broad Ligament, being its true lateral support. It must however, be remembered, that Fothergill considers that the muscular framework of the vessels, is in itself a means of support to the Uterus. Whether however, Mackenrodt's Ligament is ~~very~~ to be considered a part of, or separate from, the Broad Ligament, its importance as a supporting structure is recognised.

It is inserted strongly into the upper part of the Cervix, after interweaving its fibres with those of the Utero-Sacral Ligament at its cervical extremity. Mackenrodt maintains that the combined forces of the Broad & Utero-sacral Ligaments are essential in keeping the stability of the Uterus; & in theorising on the comparative values of the uterine supports, this likely effect of the radiating band of muscle fibres should receive consideration. The upper parts of the Broad Ligaments, would appear from their parietal attachment being behind the median transverse diameter, the uterus itself being ~~ant~~ anteposed, to limit the uterine physiological ante flexion.

#### THE UTERO-SACRAL LIGAMENTS.

The Utero-sacral Ligaments, enclosed in the Folds of Douglas, spread from the posterior surface of the Cervix outwards, upwards & Backwards, & are inserted into the parietes over the upper part of the 3rd. Sacral vertebra. The upper free portion is a thin peritoneal fold with a few muscle fibres, while the outermost part contains a strong band of muscle, which anchors the Cervix back to the Sacrum, pulling it up & back. These ligaments have an intimate relation with the Uterus, some of their fibres being continuous with the Uterine wall.

## THE ROUND LIGAMENTS.

The Round Ligaments, situated in front of the upper angles of the Uterus, are some 4 or 5 inches in length, stretching up, out & forward, & travelling through the Inguinal Canals; on emerging from which the fibres spread out & attach themselves behind the pubic bones. They are composed of muscular & elastic fibres. Under normal conditions they would tend to limit backward physiological displacement, & this to my mind, is one of their chief uses. They are probably of no use in maintaining the Uterus in physiological ante flexion, but appear to become valuable functionally, in pregnancy, labour & the puerperium. <sup>1/24</sup> It is possible that their value as a fixed point against the Uterine contractions in labour, has not yet been fully appreciated.

## Conclusions.

We hold therefore that the Pelvic Floor gives the primary support to the Uterus: that the united effect of the Broad & Utero-Sacral Ligaments maintain uterine stability: that intra-abdominal pressure produces or aids ante flexion: that the upper parts of the Broad Ligaments tend to limit physiological ante flexion, while the Round Ligaments limit physiological retro flexion.

The value of the Pelvic Floor as the primary support, has been impressed on the world mainly by the work of Hart & his followers. The comparative values of the Utero-Broad & Sacral Ligaments have formed the subject of much fruitless discussion, & it is useless to quote authorities. Their close connection at the cervical insertions evidences the fact that their actions are interdependent. Relaxation of Mackenrodt's Ligament, would result in the Utero-sacral ligaments having an unmodified pull on the Cervix, which would tend to tilt the Uterus into an exaggerated anteflexion, & a relaxation of the Utero-Sacral Ligaments would result in a dipping of the whole organ & a consequent downward drag on the Broad Ligaments.

With these few words on the anatomy & mechanism of the parts involved in the subject of my thesis, I bring the introduction to a close.

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## SECTION 2.

In seeking for a workable scheme of surgery for Displacements, in its progressive stages, we may consider the subject as falling broadly into three epochs.

I would deprecate, however, the inference from this division, that I hold that there is any rigid demarcation between these epochs, as regards either method or period of work. On the contrary, as would be expected, we find much over-lapping. The justification for this differentiation is to be found in the fact that each epoch, at its period of maximum attainment, stands out from the others both in its methods of work & in the results achieved. The first period, commencing about the year 1830, before the days of antiseptic surgery even, is entirely experimental. We find that a pathological condition has been observed & that efforts are made to remedy that condition, without much regard to anatomy or physiology. The result is, that the outward & visible sign of the lesion is treated, rather than the hidden lesion itself. Hence the Vaginal Plastics; & these proving futile, heroic attempts in other directions. All work is empirical & spasmodic.

In the Second Epoch, we find the values of the various factors forming the mechanism of uterine support, receiv-



ing consideration, & work progressing on definite lines, with record & comparison of results. Hence we have ventrifictions, vaginal fixations & ligamentous re-attachments, in series.

Work is no longer empirical & spasmodic, adequate data have been collected as the justification of courses adopted, & logical sequence is shewn in continuity of effort.

In the Third Epoch, which dates from the beginning of the present century, we find certain truths, which have been gradually working their way to the fore, fully established. Of these, two of the most important are the recognition of the Pelvic floor as the chief means of uterine support, & the acceptance of the principles of Aseptic Surgery, which guarantees our opening the abdomen, without fear of undue risk to the patient. But while the supreme value of the Pelvic Floor is admitted, the mechanism of uterine support is found to be a complicated one. From this, the surgeon draws the practical deduction that one part of this complicated mechanism cannot suffer without the other parts suffering too. Besides this, is the realisation that the mechanism is not only complicated, but also living & elastic;

That elasticity, subjected to over-strain cannot be restored, & that therefore, substitutes to replace it must be found. And that when, through some mischance, the relations between the uterus & its supports have lost their adjustment, the former is no longer an elevated organ, but becomes an inert weight, dangling from structures which were not meant to support weights; & that therefore it is necessary to support it by other means. And thus we come to the surgery of to-day, the leading feature of which is the number & variety of its suspensory operations:- as against the fewer vaginal fixation ones, the majority of surgeons feeling, as Jellet succinctly puts it, that "it is easier to support objects by vertical than by horizontal, supports". The surgeon must be an engineer too.

Operative work in cases of Displacements, may therefore be considered with reference to three epochs- the first, which may be reckoned broadly as being from 1830 to 1880, - the second, from 1880 to 1900, - & the third, from 1900 to the present day. The classes of operations, included in each, are tabulated over-leaf.

# CLASSIFICATION OF OPERATIVE WORK ON UTERINE DISPLACEMENTS & PROLAPSES.

## FIRST EPOCH - (1830 - 1880)

Vaginal Plastics & Cauterisations.

Intra-abdominal work of suspension by ovarian stump.

Ventrification without laparotomy.

## SECOND EPOCH - (1880 - 1900)

Early Ventrifications.

Early Vaginal Fixations.

Extra-abdominal work on Ligaments.

## THIRD EPOCH - (1900 to the present day.)

### Part 1.

Modern Ventrifications & Ventrosuspensions.

Modern vaginal Fixations

Operations on Ligaments.

### Part 2.

Supplementary Operations.

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## Personal Note.

In the following discussion, the observations & deductions, I have ventured to submit, are drawn from a personal experience of over 2000 operations for the relief of Uterine Displacements, throughout a period of work for 12 years. Moreover, my sphere of work has been entirely in India & largely among Indians, with whom child-marriage, with its subsequent results of an early pregnancy & labour in immature subjects, leads to the most fertile of all causes of displacements, namely rupture of the perineum, & relaxation of the pelvic floor: where such results are augmented by bad management in labour by the native midwife, by an intolerance of precautions in the puerperium, & by an excessive fecundity, which is a constant strain on the generative system.

The accompanying list embodies a record of my work on this subject, from which I have drawn my opinions.

## Primary Operations.

Adams-Alexander's ----- 134

Gilliam's -- ----- 231

Kelly's Ventrosuspension ----- 7

Ventrifications, after menopause 42 (various methods)

## Supplementary Operations.

Posterior Colporrhaphies -- --- 1000 (over). About 200 primary ones of my earlier cases.

Anterior Colporrhaphies - ---- 450 (over)

Amputation of the Cervix ----- 92

Levator Ani Suturing. ----- 65

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## FIRST EPOCH.

The earliest operative work for the relief of displacements of the Uterus, was on the vagina, & consisted of either resections of the vagina, or at attempts at contraction by cauterisation: & amputation of the Cervix where this was indicated.

## VAGINAL RESECTIONS.

These were episeorrhaphy, perineorrhaphy & colporrhaphy; the earliest authenticated operation being an anterior <sup>1/2</sup> colporrhaphy by Marshall Hall, in 1831. Although according to Sturndoff, <sup>1/3</sup> a perineorrhaphy was recorded in the 11th. century, the operator being a woman - one Trotula of the School of Salerno.

In 1835, Fricke <sup>1/4</sup> reported the first four episeorrhaphies, & Dieffenbach in 1836, reported a series of bilateral colporrhaphies, which he claims to have started in 1826. The operation fell into disuse, but was revived by Marion Sims <sup>1/5</sup> in 1856, who in trying to excise a cystocèle, found the bladder wall intact after removing the vaginal mucous membrane, & thereupon suturing the edges of the denudation, performed a colporrhaphy instead. <sup>1/6</sup> Savage, however, was the first to appreciate the actual value of the muscular tissues, & to demonstrate the real damage in a perineal tear. His first posterior colporrhaphy

was reported in 1870.

In 1877, Le Fort<sup>77</sup> described an operation, which was practically an obliteration of the vagina, by which he resected the lateral parts of the vaginal mucous membrane, & approximated the sides. for procidentia, & recorded 35 cures out of 40 cases.

From 1880 to 1890, the technique of vaginal plastic operations - not generally including any attention to the muscular tissues - was established by Hegar,<sup>78</sup> Bischoff,<sup>79</sup> A. Martin,<sup>80</sup> Doléris<sup>81</sup> & Pozzi.<sup>82</sup>

The permanent results of these operations were so unsatisfactory, that in 1888, Schultze<sup>83</sup> recorded in despair, that he found all operative work hopeless, & had come to the conclusion that bimanual reposition of the uterus with vaginal retention pessaries was the only treatment. Pozzi<sup>84</sup> advanced a step, when he said a little later, that colporrhaphies were insufficient, & had to be supported by others. At the present time, we say the converse - that the vaginal plastics are the supplementary ones, the essential ones being those on the uterus & its ligaments. The subject will be discussed under Modern Operative Work, as the methods of Hegar & his contemporaries, are still followed with very little alteration.



TREATMENT BY PESSARIES- Although this is not a subject to be dealt with at length in a discussion of operative work; still, from the point of continuity of history, a reference must be made to it, as it was a treatment, which for half a century proved the most efficacious, & even now claims some popularity. A few brief words will suffice to point out the principles, & bridge over the time from the start of appreciation of displacements as a disease, & abortive first-attempts at operative work; to the period<sup>15</sup> when surgical effort became systematized.

A pessary aims at affording a mechanical ~~support~~ support to a displaced uterus or procidentia.

In 1833, Hervez de Chegoïn wrote a treatise on pessaries & from then on, many varieties have flooded the market.<sup>16</sup> Pozzi wrote "their number increases daily", & pointed out that very many cases were unrelieved by them. Sanger<sup>17</sup> quoted improvement in 47 per cent; & Schultze,<sup>18</sup> after having dropped them once, reverted to them; but more, apparently, with the idea of their being a less dangerous form of treatment, than with any great hope of success..

And Pozzi,<sup>19</sup> never favourably disposed towards them, finally enunciated his opinion, that they should only be used as a temporary measure, until an operation for rad-

ical cure, could be resorted to. And this is the more commonly held opinion to-day.

Notwithstanding, however, the present status of gynaecological surgery, supporters of the pessary-treatment are

still much to the fore. <sup>120</sup> Herman<sup>121</sup>, in September of last year, wrote, advocating their use. <sup>121</sup> Routh, <sup>122</sup> Gow, <sup>123</sup> Lewers

are also their upholders. We have on the other hand,

such men as Sinclair, <sup>124</sup> who stated not long ago, that over a period of 17 years, he was only able to show 11 percent

of cures in pessary-treatment; as Bland-Sutton, <sup>125</sup> empha-

sising their uselessness; as Kelly, <sup>126</sup> speaking of the psy-

chopathia induced by their use; as Neugabauer, <sup>127</sup> quoting

247 cases of pessary injuries; & as Scott-Carmichael <sup>128</sup>

saying he had never known a single case where permanent cure resulted from them, & others too numerous to quote.

Whereas I, on my transfer from town to town, have come

to look on my first batch of gynaecological work in

each place, as relief of pessary complications.

To my mind, there can never be any comparison between the choice of an operation, which leaves an organ in a healthier condition, & a treatment, which places a foreign body in a passage through which there is a constant passage of waste products - on hygiene principles alone.

But further, - inflammations are a natural consequence

I think I have never come across a habitual wearer of a pessary, who has not ~~2/29~~ a considerable cervicitis & metritis; & who is not of the type known as hysterical. Ulceration of the vagina, proliferation of the mucous membrane round the pessary, ovaritis from mechanical pressure on a prolapsed ovary are no uncommon results; & lately, a case of gangrene <sup>2/29</sup> of the vagina caused by a pessary, has been reported, although the pessary was removed & washed monthly. The constant douching which is recommended to pessary-wearing patients, is in itself a source of irritation. In our present state of surgical knowledge, there are a few cases in which pessary-treatment is permissible; such as, temporarily, where women are awaiting a plastic operation of the perineum: where there is a slow involution: or sometimes, in the earlier months of pregnancy. And permanently, where physical conditions of the old - fatty heart & so on, negative operation.

CAUTERISATION OF THE VAGINA- was performed as far back as 1860, by Amussat, <sup>2/30</sup> on the posterior fornix of the vagina, & although his method never came into general use, <sup>2/31</sup> Laugier, <sup>2/32</sup> Velpeau, <sup>2/33</sup> Kennedy & <sup>2/34</sup> Dieffenbach resorted to it on occasions. It is possible that where this gave

any ~~permanent~~ benefit, not entirely transient. deeply spreading scar-tissue had resulted which might have invaded the region of the Utero-sacral Ligaments.

AMPUTATION OF THE CERVIX- received very early attention.

<sup>1/35</sup> Huguier wrote of it in 1859, & considered that hypertrophy of the Cervix was a cause of displacement, & the techniques of Simon, <sup>1/36</sup> Marckwald <sup>1/37</sup> & Schröder <sup>1/38</sup> (to be detailed later) were established from 1870 to 1880.

INTRA-ABDOMINAL OPERATIVE WORK.

In 1869, Koeberle <sup>1/39</sup> removed a healthy ovary & fixed the stump of the ovarian ligament in the abdominal wound for retro-displacement, & reported cure. In 1876, Sims, <sup>1/40</sup> & in 1879, Schröder <sup>1/41</sup> followed his example. Skene Keith <sup>1/42</sup> in 1886, <sup>1/43</sup> Kelly in 1887, & Klotz <sup>1/44</sup> in 1891 (the last in 38 cases) reported the same procedure with satisfactory results. But with the exception of Klotz' series; records were only of solitary instances: the operation did not commend itself to surgeons, no doubt, because, as Pozzi <sup>1/45</sup> in summing up the results, quaintly puts it, "the method is inconvenient, as the ovary is sacrificed, the uterus tron, & only an indifferent union is produced. It has failed several times."

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It remained for OLSHAUSEN, as Küstner says, to initiate a new era in the history of gynaecological surgery, with his paper on Ventrifications, at Berlin in 1886.

From time to time, methods had been suggested of performing a ventrification without a laparotomy. According

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to Emmet, Marion Sims in 1859 proposed, but does not ap-

/48

pear to have attempted, it. Kelly in 1889, Schober in

/49

1895 performed it on several occasions - Kelly pushing

the uterus up against the abdominal wall by a hand in

the vagina, & Schober by a sound in the uterine cavity;

both transfixing the uterus through the abdominal wall,

Kaltenbach (1889) made an incision through the muscular

part of the abdominal wall, leaving the peritoneum intact,

& operated through the peritoneum without incising it,

reporting success in 5 cases.

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In the meantime, ALEXANDER'S operation for extra-peritoneal shortening of the Round Ligaments had been placed before the scientific world, in 1883.

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In 1840, Alquié had demonstrated its practicability on the cadaver, & had submitted a report on it to a Committee of surgeons, by whom it was unanimously condemned, &

considered so futile that no report even was accorded

/52

it by them. In 1864, Denieffe performed it, but



unsuccessfully, & Freund & others tried it on the cadaver.

No success on the living subject was recorded, till

Alexander performed his first operation in 1881, & reported it in January 1883 - Adams doing it independently on only 2 months later, in 1881. Hence the double name of Adams Alexander's operation.

At this stage, the brief history of First-Attempts may be closed, & progress & technique be followed more closely.

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## SECTION 3.

## SECOND EPOCH.

The surgery of the Second Epoch, includes - (1) Early Ventrifications. (2) Early Vaginal Fixations. (3) Extra-abdominal Work on the Ligaments.

## (1). EARLY VENTRIFICATIONS.

<sup>1/1</sup>

To Olshausen, as has been said, is due the honor of being the first to establish a technique for ventrifications by a laparotomy; although a similar operation to his was performed almost simultaneously, by Kelly. Olshausen's <sup>1/1</sup> was recorded on October 23rd. 1886, & Kelly's <sup>1/2</sup> on December 11th. of the same year.

OLSHAUSEN'S method ~~method~~ was to suture the Round & Broad Ligaments as closely as possible to the abdominal wall, by three catgut stitches. Kelly's method was almost identical. Olshausen's technique varies - at times including the uterine cornu in the sutures. According <sup>1/3</sup> to Noble, this was his later & more usual procedure.

<sup>1/4</sup>

SANGER was an early imitator of Olshausen's, & published his record in 1886. Pozzi, <sup>1/5</sup> indeed, calls the operation, "the Olshausen-Sanger Operation". These two

are the chief exponents, in this epoch, of the Lateral method of ventrification; as opposed to the Direct attachment of the body of the uterus to the abdominal wall.

The great advance of Olshausen's operation over all former ones, lay in the fact that he had discovered a way to sling up the Uterus (a plan which had been found to give the most satisfactory results), without mutilation of any important part; & moreover, it was one which, would not theoretically interfere with pregnancy.

It was not however, without its dangers. The close approximation of the Uterus to the abdominal wall, against which it was held by ligatures, gave rise to the fear of direct fundal adhesion to the parietes, & therefore the chance of dystocia. On the other hand, there was the possibility of a slip of intestine being caught in the gap between the uterus & the abdominal wall, & becoming strangulated. The disadvantages being noted, modifications began to be introduced, which aimed at (1) Median adhesion, of the uterine body- commonly known as Fixation the Direct ~~Method~~ Method, which would do away with the fear of intestinal strangulation, & (2), ~~the~~ Suspension by Ligaments, or Lateral Fixation, which would

cause no interference with the uterine functions. Hence surgical work developed along the two diverging lines.

To follow up the ~~DE~~RECT FIXATION School-

The most important surgeons here were Leopold, Czerny, Terrier & Pozzi- the two former in 1888, & the other two a few years later.

But prior even to Olshausen's operation, <sup>%6</sup> Tait, in 1880, performed a direct fixation, in the course of an operation for the removal of diseased ovaries, by stitching a retro-<sup>(</sup>verted uterus to the abdominal wall. He recorded two such operations, but they do not appear to have been followed up, & a lapse of 8 years occurred before any other direct fixations were done.

#### METHODS OF DIRECT FIXATION.

<sup>%7</sup> LEOPOLD (1888), scarified the anterior surface of the fundus, & placed stitches from above down through the abdominal wall & uterus at once. <sup>%8</sup> CZERNY, in the same year, published a slightly different technique, with buried stitches through the muscular wall & uterus.

<sup>%9</sup> TERRIER ran the stitches in & out transversely along the anterior surface of the uterine fundus, to get a wider adhesion, & <sup>%10</sup> POZZI applied a continuous suture longitudinally. All therefore with the object of gain-

ing firm & absolute adhesion to the abdominal wall.

Results were so disastrous, chiefly with references to pregnancies, that for a decade these operations ceased.

%11  
& Mc. Naughten Jones, in his Review of Gynaecological Work, in 1901, voiced the general opinion, when he ~~condemned~~ condemned all ventrifictions.

%12  
It was FERGUSSON of the American gynaecologists, who at the very end of this epoch, initiated ~~xx~~ abdominal ligamentous suspension methods, by fixing the proximal ends of the Round Ligaments, which he had previously ~~xx~~ divided, in the abdominal wall. The distal ends, he tied & let drop back into the abdomen. His operation, was recorded in 1899, & paved the way for Gilliam's operation of suspension of the Round Ligaments without cutting them, which was recorded the year following; the method of which will be discussed along with other present-day methods.

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## (2). EARLY VAGINAL FIXATIONS.

Soon after the principle of slinging up the uterus anteriorly, by fundal or ligamental attachments, for correction of displacements, had been elaborated; the de-



sirability of doing this without the necessity of a laparotomy (a much more serious operation then, than now) began to receive consideration, & a new site was found in the vaginal vault.

13

SCHÜCKING was the originator of this method, the details of which he published in 1888. His technique was as follows:-

Having dilated the uterine cavity, he pushed the uterus down into a position of anteflexion, & threading doubly a needle on a handle, he passed it through the dilated cavity, piercing the anterior wall, transfixing the vesico-vaginal fold of peritoneum, & entering the anterior fornix of the vagina. The stitch being tied, was then left in for six weeks. No incision was made. In 1891, he published results on 88 cases, which he had followed up out of a total of 217. 30 per cent adherent retroversions were cured, according to his data, & out of these 217, there were 23 cases of full-time deliveries.

14

ZWEIFEL modified the operation, by making an anterior colpotomy, to ensure the safety of the bladder

Two principles governed vaginal fixations- (1). That attachments should be made to the vesico-vaginal fold,

advantage being taken of the distensibility of the structures included, & thereby permitting labour without fear of dystocia (2). That the uterus should be fixed firmly, with the aim of obtaining a steady body interposed between the pelvic floor & abdominal contents, - without consideration of difficulties that might arise in future pregnancy. It is clear that this was hardly justifiable without a prior menopause, either natural or artificial.

The two chief exponents of the former class, that is of these who sought attachments to the peritoneal fold only, were Mackenrodt & Dührssen.

7/6

MACKENRODT described his operation in 1892. His technique is as follows:-

Long median incision from urethra to cervix & transverse one ~~7/6~~ at the base of the cervix. Flaps dissected up, & bladder pushed up out of the way. Peritoneum cut across transversely & the fundus drawn down into the aperture. The vesico-vaginal pouch of peritoneum stitched down to the uterus by a continuous suture, & the opening closed.

7/7  
Later on, he worked through an elliptical incision, along the vaginal anterior fornix.

718

DÜHRRENN'S essential difference from Mackenrodt's, is that he applies no buried sutures. A silkworm gut suture <sup>is</sup> passed through the vaginal wall, peritoneum & fundus, near the angle of the Fallopian Tubes, across to the other side, & out in the same way; the ligature being left open till the wound is closed, when it is tied. It remains in for six weeks.

In quoting results, he gives, in one set of statistics, a total of 359 cases with 2.3 per cent failures. There are 20 confinements noted, in which 2 required instrumental aid in labour. In another set, he quotes 70 pregnancies occurring after the operation, in which 9 required artificial delivery. There was a tendency to abort.

Of the second class, - those who fixed the uterus permanently & intimately, are Freund, Wertheim & Schauta.

719

FREUND'S operation recorded in 1895, was performed through a posterior colpotomy, & was suited for both prolapse & retro-displacements. His technique is the following-

Large opening in posterior vaginal fornix, extended into Douglas' Pouch. The posterior surface of the Supravaginal part of the Cervix sutured to the parietal peritoneum over the sacrum. Douglas' Pouch packed with

gauze, to produce further adhesions.      Supplementary

repair of the pelvic floor if indicated.

/20

WERTHEIM'S operation recorded in 1899, was performed through an anterior colpotomy. It consisted of an incision through the anterior vaginal wall & anterior peritoneal pouch. The lower parts of the edges of this opening drawn down & stitched to the Cervix. The uterus stitched down to the anterior vaginal wall, & the opening closed.

/21

SCHAUTA has practically the same method as Wertheim, but leaves the fundus free. The operation is often called the Schauta-Wertheim operation.

The object of the Schauta-Wertheim operation is that the uterus, by virtue of its new position, is made to transmit the intra-abdominal weight to the perineum, & the resistance from the pelvic floor upwards. It acts in two ways- " as an obturator in a hernial opening, & as a lever, having its point d'appui on the perinaum" ( Macan)

The advantage claimed over Freund's operation, is that with Freund's it is possible for such an intimate relation to result between the Os & the parietes, that an



82

anterior colpotomy might be necessitated, with an opening in <sup>to</sup> the fundus, to allow exit of discharges, the cervical opening being practically closed.

Wertheim sometimes added a shortening of the Uterosacral ligaments to his interposition operation.

1/22

Another class of operation was performed by Von Rabenau

1/23

& Schmidt about the same time, who operating through an anterior colpotomy, separated the uterus from the bladder fold, & cut out a wedge from the upper part of the cervix or uterine body, bringing together the upper with the lower portions of the wedge, & suturing them.

1/24

Pozzi condemns this, by saying that the cervix was drawn forward as well by this, & the retroflexion would probably be exaggerated.

1/25

Pozzi, in summing up the results of the vaginal fixations of the second epoch, points out that the Mackenrodt class fails by the distensibility of the tissues, & the Freund's class appears to be no less dangerous than abdominal fixation.

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### (3) EXTRA-ABDOMINAL WORK ON THE LIGAMENTS.

This work is carried on at two sites- (1) at the Inguinal Ring, & (2) through the Vagina.

The work at the Inguinal Ring, consists of the Adams-Alexander's operation, & its various modifications.

126

THE ADAMS- ALEXANDER'S operation, stands out by itself, as being the one operation which has, through evil & good report, maintained a definite position for itself from the early part of the second epoch to the present time, without any essential variations in its technique. We have seen that Alquié recommended it as far back as 1840. Alexander & others worked at it steadily from 1880, & it is still one of the classic operations for Retro-displacement. I shall carry on its history in this section, to its present position, as no reasonable line of demarcation exists between epochs, with reference to it.

The operation consists in the shortening of the Round Ligaments after their exit from the Inguinal Canal, the introductory history has been given before.

127

The technique of the operation given by Alexander, in the article entitled "The treatment of backward displace-



ments of the Uterus & Prolapses Uteri, by shortening the Round Ligaments", is as follows:-

Incision of 1 to 2 inches long, from pubic spine parallel with Poupart's Ligament. The Round Ligament freed from adhesions by the fingers. The Ilio-inguinal nerve cut across. The Uterus held in the proper position by the Assistant with a sound. In Prolapsis, the Ligaments pulled out as far as possible. The Ligaments fixed at the External Ring, by a wire suture passing through the skin of one side, the adjacent pillar, deepest part of the ligament & through the pillar & skin of the opposite side. Another stitch or two passed through the more internal structures. The silver wire fastened loosely. The superfluous loop of ligament either packed in the lower end of the wound or excised. The wound closed. A Hodge's Pessary placed in the vagina & the sound withdrawn. When the wounds are healed, the patient may move about with the pessary in situ, which is removed in a week or two.

There have been a few modifications to the original operation.

/ 188  
DOLERIS joins the loops of the two ligaments, by joining them in the middle line over the pubis, the incision being extended across.

<sup>129</sup>  
 EDEBOHLS incises the whole inguinal canal, which is closed later by catgut stitches, which serve also to fix together the Round & Poupart's ligaments. I may say, that in 1903, when I published a record of 40 cases, <sup>130</sup>  
 I also advised the opening up of the canal, rather than risking the disturbance of the tissues, in the search for the Ligament, if it was not apparent. Edebohls recorded in the New York Journal in 1890. My observation was independent.

<sup>131</sup>  
 NOBLE strengthens the Canal wall, by making the two layers of the External Oblique over-lap.

<sup>132</sup>  
 GOLDSPOHN dilates up the Internal Abdominal ring, with his finger; by which method he can insert his finger into the abdominal cavity & search for adhesions or diseased appendages.

There are few operations round which controversy has circled more, or against which more objections are quoted, which can be referred to faulty technique, & lack of discrimination in choice of operation.

Among the objections, are - (1) Difficulty in finding the ligaments. (2). Difficulty in delivering them when found. (3). Tearing the ligament. (3). Hernia, as a remote result. (4). Interference with labour. (5). Inabil-

to examine the appendages.

1/33

Noble quotes his established technique, on a series of 200 cases. I have performed 134 Adams-Alexander's, & have made careful & exhaustive notes on them. My technique is as follows:-

Find Pubic Spine & External Abdominal Ring by the finger. Make an incision over the External Ring from the Pubic Spine outwards, parallel with Poupart's Ligament. Care is to be taken to hold the skin steadily by two fingers laid flat on the surface & between which the incision will be made. If the incision comes to lie away from the Ekternal Ring, difficulties will be met with at once, in the dissection. A great deal depends on a clear cut incision down on the Ring without disturbing the tissues, which are loose. Skin only should be included in the first incision, as the vessels are large & superficial & should be clamped on either side, before dividing, to prevent the blood trickling down into the tissues, which obscures the field of work.

Dissection should be carried down steadily & lightly, till the columns of the External Ring are seen, when the tissues can be pushed apart by a blunt instrument. The yellow fat which is seen bulging up into the Ring, is diagnostic, & can be dissected out.

If the operation has been carried out so far with care & niceness, & the wound kept dry, the ligament will now generally be seen as a round, pinkish cord- pinker at any rate, than the white, glistening fibres alongside- appearing from under the internal pillar of the Ring, flattening towards to further end, then opening out like a fan. The Ilio-inguinal Nerve will generally be found crossing the Round ligament from without inwards, either at the Ring or in the Canal. This nerve should be held back in the retractors, during the operation: it cannot be mistaken for the Round ligament, as it is entirely rigid, & irresponsive <sup>sive to a</sup> ~~to a~~ pull. Its existence should be borne in mind throughout the operation, as cutting it will produce local anaesthesia over the pubis & labia, & stitching it down will cause neuralgic pain for several days. This has happened to two of my cases, in both of which I had been unable to differentiate out the nerve.

The part recognised as the ligament, is lifted up in a forceps, & pulled gently to make its diagnosis absolute. If it be the ligament, it will respond to the pull (unless held back by adhesions) & its elasticity will be apparent; but the traction should be made in the line of axis of the Canal- an important point. I have seen a surgeon about to give up the operation, because he

could not find the ligaments, when his only difficulty was that he was pulling away from the axis.

If the ligament is not made out at once, rather than disturb the tissues, I prefer to cut up & open out the Canal. To attempt to find an attenuated cord at the Ring, after the fibres of the fascia have been separated by pulling, is hopeless. There is never any difficulty in finding the cord in the Canal with the Nerve crossing it from without in, anteriorly.

The ligament found, it should be drawn out in a series of gentle & short pulls, the tissues surrounding it being cleaned at the same time, by a blunt instrument or cloth. If the serous membrane appears as well, it can be pushed back in the same way, no harm is done. NOTHING else will respond to the pulling - the nerve is entirely rigid, the parallel fibres of the fascia nearly so.

Having freed the ligament from the ~~qazqz~~ surrounding tissues, till it can be slid smoothly in & out of the canal, it can be let drop back. The weight of the uterus will withdraw it entirely from the surface, hence an instrument should be placed under it so that it can be picked up easily when required. The wound is then covered till the other side is ready.

The ligaments being free, each will be lifted by the



surgeon in separate forceps, & drawn out of the wounds  
 at the same time: an assistant who will have placed his  
 fingers in the vagina just before this stage, will help  
 to raise the uterus. He will feel it being lifted up by  
 the surgeon, & will be able to inform the surgeon re-  
 garding its position. The position being adjudged, the  
 ligaments are clamped & each in turn is fixed. If the  
 uterus is at all enlarged, & therefore heavier, or if the  
 retroflexion has been extreme, I get as much ligament as  
 I can. I fix the ligaments to the two columns, & also to  
 the anterior wall of the Canal as a rule, by silk or linen  
 thread, always seeing that the nerve is free. If the  
 canal has been slit up, these same stitches should close  
 the canal. The superfluous loop of tissue from the lig-  
 ament, I either reflect over the wall of the canal &  
 stitch down, or else stitch over the Ring, whichever  
 part seems to require the more strengthening. The ves-  
 sels in the abdominal wall are now ligatured & the wound  
 closed. I have never placed a pessary in the vagina.  
 The patient is kept in bed till after the next menstrual  
 period. The time of ~~the operation~~ election for the oper-  
 ation, is when the uterus is at its minimum weight, that  
 is midway between the two menstrual periods. After the  
 first few days, the patient is encouraged to sit up in



bed to promote intra-abdominal pressure. When indicated a perineorrhaphy is done. Cases that require a colporrhaphy, are best met by an abdominal suspension.

I have found that stretching of the ligament occurs mainly at its distal portion - at the External Ring, & in the Canal: the intra-abdominal portion remaining comparatively healthy till late, & my technique includes the withdrawal of the ligament from the canal, till the intra-abdominal part is brought down, & fixed. It can be recognised by a bulging in the ligament, which occurs immediately behind the Internal Abdominal Ring.

I have ventured to give my technique in detail, as it contains points of some practical importance, which I have not seen noted in any literature on the operation. As for instance, the value of a clean incision down on to the Ring, a dry field for dissection, the importance of traction on the ligaments being made in the axis of the Canal & their withdrawal in gentle separate pulls, rather than by a long steady one, the importance of traction as a means of diagnosis of the ligaments, & the management of the nerve.

To discuss the objections quoted:-

Difficulty in finding the ligaments - Alexander, in

answer to a direct question on this point, said that the secret of finding them, was to cut up the External Oblique, a distinct shining structure, & then seek the

Internal Ring. In about 1 per cent, it is too brittle

or too fine to pull out. " <sup>1/45</sup> Noble says, referring to his

200 cases, & quoting Edebohls' <sup>1/46</sup> opinion in support, that

" in spite of the statements of some authors, there need be no hesitancy in saying that the Round ligament can

always be found in the Inguinal canal or at the Inguinal

Ring. The Round Ligaments were invariably found in the Inguinal Canals, in my experience, with one exception."

Out of my 134 cases, one in one side of each of two cases

was not found by me. In one case, the woman was old &

there was a long-standing proidentia, & I presume the

ligament was too attenuated. It was not a suitable case

for the operation, as later experience has taught me.

The other failure, I put down to faulty work, - the operation being done under the disadvantage of great heat.

Delivering the Ligaments. I have explained the technique to be followed.

Tearing the Ligament. There need be no fear about this. The moment the ligament begins to tear, the surgeon can appreciate it readily by the sensation, through the

as a rule  
 forceps. The fibres begin to give just at the proximal side of the forceps, & all that has to be done, is to catch the ligament by another pair, within the tearing point.

Hernia as an after-result. I have heard of none occurring in my series of cases. <sup>137</sup> Noble has the same experience. <sup>138</sup> Edebohl's records one double hernia, after pregnancy in 100 cases.

Relation to pregnancy- There is no bar to pregnancy.

<sup>139</sup> Noble quotes 37 pregnancies in 96 cases: Edebohl's, 11 in 115. I myself was able to keep in touch with 42 cases out of my first 100. Of these, 8 were confined either in my Hospital, or by my district nurses. No difficulties were reported- not even the dragging pain complained of in some of Noble's cases. <sup>140</sup> In fact, ~~unpleasant~~ complications were unknown.

Inability of examining the abdomen- An experienced clinician can readily gain sufficient knowledge of physical conditions in cases suitable for the operation, by bimanual examination. Goldspohn's modification would do away with this disadvantage, but would tend to lead to hernia complications.

## RESULTS.

Out of my 134 cases, 131 were cured, or improved sufficiently to have lost most of the symptoms complained of; & of these, 42 were kept under inspection for over a year.

Two already reported as semi-failures - the ligament having been caught up at one side only - left the Hospital much relieved. Both refused any further treatment. A third died from causes unconnected with the operation. I have never had an anxious symptom resulting. <sup>1/40</sup> Noble quotes one failure, & one partial failure, in 200 cases. Harrington <sup>1/41</sup> compiled statistics of 140 cases by 134 surgeons with one death. This is the only record of a death resulting from the operation, that I can find; so the operation can be considered a harmless one. <sup>1/42</sup> Parli of Strasburg, reports however, the following results on 117 cases combined with plastic vaginal repair:- in 55 Adams-Alexander's, there was recurrence in 49 per cent - a very different result from most people's. <sup>1/42a</sup> Sinclair gave 20 per cent of failures. <sup>1/42b.</sup> Jellett reports 40 cases operated on by himself, with only half per cent recurrences- this is about the same as <sup>1/43</sup> Noble's; while mine remains under one per cent. Haunes of Breslau, collected the permanent results from 1896 to 1906, of the Edebohl's & Goldspohn varieties, from various surgeons, mostly German. There were, approximately

4 per cent failures. There is no doubt, that indiscriminate choice of case, has much to do with the heavy failure list of some. The operation should only be resorted to for simple displacements, uncomplicated by adhesions, increase of bulk in the uterus, procidentia or diseased appendages. Where increase of bulk does not yield to curettage & tamponage, or is not corrected by amputation of the Cervix, all idea of an Adams-Alexanders should be given up, & an abdominal suspension done instead. In my opinion the success of the operation lies in getting beyond the stretched tissue, & fixing the ligament by a healthy part.

The real disadvantage of an Adams-Alexanders is the limited field in which it can be beneficial. It cannot claim the sphere of usefulness ascribed to it by Alexander, when he named it "an operation for retro-displacements AND prolapses". It is no good for prolapses, & only for some displacements. But acknowledging that its limitations are great, it may claim to be an ideal operation in its applicability of carrying on the physiological intent of the structures: it is harmless to life, & the stronger parts of the ligament are made use of for support. Mc. Naughton Jones, gave the palm to this operation, in his gynaecological Review in 1901, & in the



present day, it receives very favourable comment.

<sup>1/45</sup> Jelleff, <sup>1/46</sup> Kustner & <sup>1/47</sup> Smyly consider it the operation of selection, in uncomplicated displacements. Kustner considers it the best even if the case is complicated by adhesions - the adhesions to be freed by a laparotomy. And I, with all diffidence, am inclined to that opinion myself.

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#### SHORTENING THE ROUND LIGAMENTS THROUGH THE VAGINA.

<sup>1/48</sup> Goffe & <sup>1/49</sup> Wertheim in 1898, <sup>8</sup> & <sup>1/50</sup> Vineberg of New York in 1896, operated on the Round Ligaments through this site. The uterus is exposed through an anterior colpotomy, & silkworm gut stitches placed through the Round Ligaments, at their insertion into the uterus. These are carried through the margin of the vaginal flap, & tied loosely in the vagina. The incision is closed, & the suture removed in about 10 days.

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## SECTION 4. Part 1.

## THE THIRD EPOCH.

With the third epoch, gynaecology, as we knew it, begins And to no realm of Surgery, has the adoption of the routine of Asepsis, which opens up an unlimited field of intra-abdominal work, <sup>given</sup> a greater impetus <sup>to</sup> than <sup>^</sup> this.

The surgical work of this period, may be classified, thus:-

VENTRIFICATIONS- or direct attachment of the Uterine body to the abdominal wall.

VENTROSUSPENSIONS - the attachment of the uterine body or its peritoneal coat with only a small portion of its muscle, to a thin section of the abdominal wall, in such a way, that the attachment stretches itself into false ligaments, which suspend it.

VAGINAL FIXATIONS - where (as has been noted already) the uterus is either fixed to form a solid body between the Pelvic Floor & abdomen, or ~~it~~ is attached to the vesico-vaginal peritoneal fold.

## OPERATIONS ON THE LIGAMENTS.

VENTRIFICATIONS. There is an unfortunate looseness in the literature of the subject, in the use of the words Ventrification & ventrosuspension. Ventrification is

used indiscriminately to mean, either the direct fundal adhesion, or the suspension that results from the formation of false ligaments. Ventrosuspension, may mean the operation just mentioned, or suspension by the actual ligaments. In this thesis, ventrification is taken to mean the direct & intimate attachment of the fundus to the abdomen.

THE OPERATION. The methods of the earlier surgeons are still in vogue; but the operation is not a favorite one & owing to the necessity of a prior sterilisation, its scope of usefulness is limited. According to Kelly, it is indicated for the reposition of the prolapses of "large heavy uteri." A method of his is to denude the recti muscles of their sheath, & burying the uterus in them, to transfix it there. Eastman also includes the whole fundus in the abdominal muscles. The operation is not universally successful. Eastman quotes cases of sinking in of the abdominal wall after a ventrification, with a return of the prolapsis; & this would be more likely to occur in such cases as Kelly considers most suitable for the operation, namely "large, heavy uteri." And yet it seems almost the only operation yet devised, that gives any hope of relief. Vaginal Fixations are credited with being useful where there is procidentia; but it is



evident that where an enlarged uterus forms a complication, such a body held in anteposition, by a vaginal fixation, cannot fail to cause some irritation to the bladder.

An alternative hysterectomy has been performed. Of the

second epoch writers, Pozzi<sup>14</sup> condemns an abdominal hysterectomy entirely; but considers a vaginal one more

suitable, & claims a moderate success with it. Fritsche<sup>15</sup> performed it 8 times.

Speaking generally, hysterectomy is ~~not~~<sup>not</sup> to be recommended, as procidentia of the other pelvic & abdominal

viscera may be not only unrelieved, but exaggerated; or a

complete hernia may occur. Küstner<sup>16</sup> records two cases

of bladder prolapse after it. Haunes<sup>17</sup> another. Vauverts<sup>18</sup>

7 cases of bladder inversion. Against this, is the argu-

ment, that the chief factor that tends to increase the

prolapse - the dragging down of the viscera, by a weighty

organ is removed by the hysterectomy, & it seems possi-

ble that with a general tightening up of all the uterine

supports, they being fixed into the uterine stump, & that

again into the parietes, that a greater degree of com-

fort may be obtained for the patient, than by any other

means. This, however, will be a question for the surgeon

to decide on the individual merits of the case. Polk records<sup>19</sup>

also Balay<sup>19a</sup> an operation on this method, Colporrhaphies will be required.



# VENTROSUSPENSIONS.

The term is taken here to mean the suspension of the uterus to the abdomen by formation of false ligaments.

The operation was originally meant for, & was called a ventrification; & consisted in suturing the uterine fundus to the abdominal wall, in one or other of the ventrifications already described. (page 26)

X/10 X II  
Kelly & Penrose appear to have been the first to describe the formation of a fine ligamentous adhesion resulting from the operation, which they found on cutting into ~~the~~ an abdomen, on which it had been performed previously.

Corroboration of such a resulting condition was soon forthcoming from many surgeons in various countries, & it seemed safe to conclude, that with an elaboration of technique, such a result might be relied on. Its advantages, provided the object of holding up the uterus was maintained, over the fundal adhesion, were obvious—as it would, by its looser connection, lessen the risk of dystocia.

X/12  
Kelly quotes a record of 17 cases in which the abdomen was reopened, in a period extending from 10 months to 3½ years, after ventrosuspensions; & in every case long ligamentous adhesions had formed— in most cases, a single ligament. In the earlier cases, the uterus had received

the ligature on its anterior surface, & therefore it lay  
 retro-  
 in ~~the~~ position. Hence arose Kelly's modification, of  
 suturing it on its posterior surface, so that it would  
 come to lie in its normal position of ante flexion.

1/19

His technique is as follows-

Median abdominal incision coming well down over the pubis.

Examination of appendages & correction of morbidities.

The peritoneum, held out by the forceps, is transfixed  
 on its inner surface, about half an inch being taken in,  
 in the transfixion. The uterus is brought well up into  
 the wound, & the posterior surface pulled forward as  
 far as possible, so that it <sup>may</sup> ~~should~~ lie superiorly.

The peritoneal suture is passed into the posterior uter-  
 ine wall, about three-quarters of an inch below the level  
 of the line connecting the insertions of the tubes, en-  
 tering the body transversely, to the depth of about a  
 quarter of an inch. A second suture inserted through  
 the abdomen on the other side of the uterus, but half  
 an inch lower than the ~~former~~ stitch. A third stitch if  
 required, is applied. The uterus is then pulled up to the  
 abdominal wall & fixed there. The abdominal incision  
 is closed in the usual way.

Autopsies & re-openings of abdomens on which this has  
 been done, show that the uterus only remains against

the abdominal wall for a short time, the false ligaments forming in about two to three months.

<sup>1/14</sup>  
 Berkeley & Bonney, in their text-book based largely on the records of the Middlesex Hospital, London, give a slightly different technique from the preceeding. It varies from the other, in that the parietal peritoneum is not divided as low as the muscular wall. The uterus is raised to the wound, & the parietal peritoneum, showing at the lower end, is pulled over it. The posterior surface of the uterus is dragged forward, & fixed to it & to the fascia of the abdominal wall, immediately in front of the peritoneum. They claim that the inclusion of the fascia will limit the stretching of the false ligaments, & state that this result has been observed by them in re-opened abdomens.

Another modification of the operation is George Fowlers.<sup>1/15</sup>  
 He dissects a <sup>rect-</sup>~~rect-~~angular strip of peritoneum from either side, leaving it hanging by its base, which is upwards. The two flaps thus formed are stitched over the posterior surface of the uterus.<sup>1/16</sup> Franklin Marten has a similar method.

The value claimed for this ~~method~~ operation, lies in the uterus

resuming its natural position of ante~~flexion~~ion. This position being arrived at, is said to be permanent, theoretically it forms no bar to pregnancy, nor should it complicate labour. Unluckily, the practical results, in the hands of most surgeons, do not realise the proclaimed hopes, in any great measure. Even Kelly, the exponent of the operation, only quotes 60 per cent cases in which permanent benefit has been obtained: Berkley & Bonney however quote 95 per cent of cures, & say "it fulfils all ~~obje~~ objects"; while Tweedy <sup>7/7</sup> has performed it over 300 times, & considers the operation curative.

On the whole, however, it is not an operation that has gained the confidence of the profession generally, & is probably the least popular of all the classic operations for displacements. The mass of records in literature of dystocia & Caesarian Section following it, cannot afford to be overlooked. It is unnecessary to burden this paper with detailed references of this record, as hardly a month passes but one or other journal mentions one.

Even when the operation is successful, & the false ligaments have formed, dystocia is no uncommon thing; & when ligaments do not form, & pregnancy occurs, Caesarian section is almost always imperative. There are sev-

eral factors, some beyond the control of the Surgeon, which may militate against the formation of the false ligaments, & which would bring about a fundal adhesion where only a false ligament was intended. Such may be - an early onset of menstruation (which often occurs in the operations on the uterus) causing a hyperaemia of that organ: a too tight bandage, pressing the abdominal wall on ~~the~~ to it: a temporary paresis of the bowels, pushing the uterus up: bruising the uterus during the operation, & possibly others.

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Sinclair says, paradoxically though truthfully, that it is only in extent to which the adhesions give way in Kelly's operation, that it is of benefit to the patient.

Another serious complication is intestinal obstruction. A series of 25 obstruction cases, shown either at autopsies or in the theatre, is quoted in the American Journal of Obstetrics, 1909, p.653. Berkeley & Bynney claim there is less fear of this in their method than in Kelly's.

/19

Jellett remarks that when the false ligaments did not complicate labour, they would probably give way. And judging from the large number of recurrences recorded

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after labour, this seems likely. Holden records 35 per cent recurrences, in ~~the~~ those who have become pregnant



1/20a

later, & a series of 28 reopened abdomens shewed 12 in which the ligament had entirely disappeared.

PERSONAL EXPERIENCE. I have had very little personal experience of this or of the previous operation, & have only found it necessary to have recourse to one of them, when a preliminary sterilisation has been permissible, or the climacteric has passed; & even there, I prefer the direct fundal adhesion to Kelly's. My experience of complications ensuing from Kelly's operation performed by other surgeons is instructive - that is, those done before a menopause. In a Hospital appointment, I held for 16 months, my predecessor appeared to have been an enthusiast over it. Out of 75 morbid labours, I had in one year, 5 were ones requiring delivery by laparotomy for dystocia caused by Kelly's operation. Of other complications from it, I had to operate for appendicitis, due to adhesion of the appendix to the false ligament, & for two cases of intestinal obstruction. This is the only operation for displacements I have met with, where such serious complications have followed. After such an experience, which endorsed my theoretical objections to it, it is apparent one would not be encouraged to resort to the operation where a choice of operations presented themselves.

## VAGINAL FIXATIONS

The chief exponent of modern Vaginal Fixations, is

<sup>1/21</sup>  
TWEEDY. The principles of his operation depend firstly on the production of anterior fundal adhesion with the peritoneal vesico-vaginal fold, & secondly on a backward tension exerted on the Cervix by the Mackenrodt's Ligaments, which being liberated, have their proximal ends (sometimes cut) brought round, & fastened to the front of the Cervix. The former principle is the same as <sup>1/22</sup> Dührssen's, & the second is an adaptation of Alexandroff's work on the Broad Ligaments.

His technique is as follows:-

Anterior colporrhaphy & free exposure of the bladder.

Elevation of the bladder from the Cervix till the peritoneal fold is reached. Reduction of the Cervix to its normal size, if enlarged, by wedge-shaped amputation.

<sup>es closing</sup>  
The stitching <sup>^</sup> the wedge, not to include the mucous membrane, & to be left long enough to form tractors on

the cervix. Free incision into the peritoneum, & dis-

location of the uterine fundus through the opening. The

application of a couple of catgut or silk stitches, through

lateral vaginal flap, peritoneum, & anterior surface of

the uterus, midway between the tubes & half an inch below

them. These sutures held in forceps (not tied) & the per-

itoneal wound closed. Mackenrodt's Ligament exposed by pouching up the mucous membrane from the cervix. The proximal ends of the ligaments brought in front of the cervix & fastened there. The mucous membrane closed & Lawson's Tait's perineorrhaphy <sup>performed</sup> if required.

Tweedy says that at the end of three weeks everything appears in the normal position. He has heard of no troublesome results, & at least 8 patients on whom the operation has been done, have been delivered naturally. He sometimes shortens <sup>S</sup> the Utero-sacral Ligaments.

7/13

Solomons, formerly Assistant Master of the Rotunda, quotes statistics of 26 cases followed up. Of these, the results are - Cured 7, 19. Relieved temporarily, 1. Fair, 3. Unrelieved, 3. That is 73 per cent of successes - not an overwhelming record.

7/24

Another exponent of the operation, is Vineberg of New York, who asserts that as far back as Sept. 2nd, 1902, he published his opinion that vaginal fixation was the operation of selection for procidentia, especially where there was a marked rectocele. There is no essential difference from Dührssen's technique. Vineberg lays stress on some very practical points worth noting, which are

7/25

(1)... To release the lateral vesico-vaginal folds as well as the median, or the risk of two lateral cystoceles forming, is to be feared. (2)... To apply drainage to either side of the cervix, for the first 24 or 48 hours as there is generally some oozing.

He also performs a high amputation of the cervix to prevent it acting as a wedge, & advises that the operation should not be performed during the child-bearing period. Of results, he quotes a record of cures in all of 45 cases, which he has kept under inspection for 2 years. His operation therefore seems to be a useful one, under its limitations of avoidance of the child-bearing period.

PERSONAL EXPERIENCE. It is not an operation, of which I have had any experience. Conditions in which it may have been the<sup>o</sup>retically the best operation, have been met by me in other ways, to be referred to later. The necessity of a prior sterilisation of the patient has been always realised by me; & in a land where an artificial menopause permits a man to put away his wife, it is seldom that a woman will consent to it.

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The two operations of Dührssen & Schauta-Wertheim are still performed with no difference from their earlier technique. Dührssen's still shows a perceptible pro-

portion of morbid labours following it; while Caesarian Section, resulting from the Schauta-Wertheim's is still being recorded.

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#### OPERATIONS ON THE LIGAMENTS.

These have to be considered with reference to each set of ligaments- namely, the Round, Broad & Utero-sacral. There is one operation, which it is difficult to place in my classification. I refer to the Olshausen's, which includes both the Ligamentous & the Direct Uterine attachment, in the one operation. Although Wertheim speaks of it as only "suturing the Round Ligament to the abdominal wall", it is evident that the operation consisted even primarily, of much more than this, & latterly of the actual inclusion of the cornua, which along with a longitudinal suturing of the Broad Ligaments "just outside the uterus" & a certain amount of suturing of the Round Ligaments along their length, would bring about a much more comprehensive adhesion than would justify the name of a ligamentous suspension. The operation is seldom performed in its original form, now. Vineberg speaks of having performed it for 15 years, with good results, but I note his modifications are extensive.



## ROUND LIGAMENT OPERATIONS.

Of these the Adams-Alexander's has been discussed in full. And the only other operation on them, meriting discussion, is that known as GILLIAM'S, which shortens the Round Ligaments intra-peritoneally, & finds a new fixation point for the distal ends, in the abdominal wall.

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GILLIAM'S Operation, recorded in 1900, consists in drawing up a loop of the Round ligament through the rectus muscle & fascia, & fixing it in the abdominal wall.

The essentials of his technique consist in puncturing the rectus, fascia & peritoneum with a sharp knife, about three quarters of an inch external to the median incision, on either side. Forceps are placed through this slit, catching up the Round Ligament, the uterus being held forward. The Round Ligament, is then grasped from  $1\frac{1}{2}$  to 2 inches away from the cornu, drawn back through the incision in the rectus & sutured to the fascia of the External Oblique by catgut, after the uterus has been drawn into a suitable position. The muscular wall is ~~then~~ closed, after both ligaments have been delivered in this way. The two loops of ligament, thus formed remain outside the muscular wall, & are brought across the median line, & stitched in position, to prevent retraction.

The advantages claimed for this operation are- (1)

- (1) Entrance is gained into the abdominal cavity permitting examination of its contents.
- (2) The uterus is suspended by the stronger parts of the Ligaments.
- (3) The natural functions of the uterus—pregnancy & labour are not interfered with.
- (4) The operation is simple, quick, & presents no difficulties even to the inexperienced.

The Disadvantages quoted are- (1) The anterior lower hypogastric region is divided into three compartments, into which bowel may be drawn & become strangulated.

- (2) A possible tendency to abortion from the uterus being more anteverted than usual.
- (3) The uterus, being directly pendant from ligaments which are not intended to carry weights, & which are therefore likely to lose tone & stretch, has a tendency to revert to its former mal-position.

To obviate the first disadvantage, various modifications have been suggested.

y, 3/

KELLY ties a loop in the posterior two-thirds of the ligament, & pulls the loop thus gained through a slit in the Broad ligament, towards the Internal Abdominal ring, & sutures it to the fibres of the External Oblique.



He appears to have given up this method, as there is no mention of it in the later edition of his book; possibly because the danger of bowel-strangulation has proved to be only a theoretical one. Although I have lately made an exhaustive study of the literature of the subject, & have not been able to find more than one record of its having actually having occurred, & that record is not supported by data, nor is it first-hand. I have never met with it as a complication resulting from my own or any other surgeon's work, although I have been in constant touch with the operation for the past four years. <sup>/32x</sup> Noble & <sup>/32b</sup> Macfarlane both record the same experience.

<sup>/32b.</sup>  
MACFARLANE ( of Glasgow ) pierces the rectal sheath, at its thickest part, about one & a half inches below the level of the spine of the ilium, & says the amount of ligament delivered should depend on its laxity. The distal portion he tightens up as far as it will go, in the assumption that this will lessen the "theoretical fear" of strangulation.

<sup>/33</sup>  
BERKELEY & BONNEY (1911), as illustrating some of the London methods, have practically the same technique as Kelly.



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WEBSTER also does much the same, drawing the Round Ligament back through a Broad Ligament slit, & stitching it to the posterior surface of the uterus; but the tension is left thereby on the anterior, weaker parts of the Round Ligaments.

Other modifications are the following-

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WYLIE, BODE, MANN, & BYFOLD work on the principle of folding & suturing the ligament on itself, with the avowed intention of strengthening as well as shortening.

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DUDLEY folds the ligament on the anterior surface of the uterus, leaving the weaker parts of the ligaments to bear the weight.

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CHANNING BARRETT & MAYO both draw the ligaments through the median incision, fastening them to the fascia of the abdomen.

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BROMWELL-BRANCH makes a purse-string suture on the distal half of the ligament, stitching it to the Internal Abdominal Ring.

The above list represents all the varieties of work done on the Round Ligaments.

Of the disadvantages quoted against Gilliam's, three out of the four seem remote, & two of those three only theoretical. For the class of operation that consists of

folding the ligament on itself, there is not much to be said. It is evident that over-stretched fibrous & elastic tissue is not likely to recover tone by this means, & that stretching will continue.

## RESULTS .

Statistical quotations on the cures effected by Gilliam's Operation, are meagre; but it is interesting to note that reports of serious complications resulting, are nil - an unprecedented record in Uterine Displacement work.

/ 42 b

Macfarlane quotes a series of 140 cases with 85 per cent relieved. Only one appears to have been an actual failure however, & that an unsuitable case. 16 of these became pregnant, with one abortion.

/ 42 c

Hemiston, President of the Amer. Obst. Society, states he has followed up cases for 3 years, with permanent benefit noted in all, & with no dystocia complications. Noble (1911) edition ) does not commit himself to quotations of results, but is, apparently, not enthusiastic.

In the Br. Medical Journal of Feb. 1912, a series of 100 Gilliam's Operations are quoted, with satisfactory results.

/ 42 d

The Australian Medical Gazette, gives one failure in 21 cases (Hamilton's).

And at the Glasgow & North of England Obstetrical Society, (1911) the palm for Displacement Surgery was given to



# Vaginal Fixations & Gilliam's.

PERSONAL EXPERIENCE. Since 1908, I have performed Gilliam's Operations & a modification of it 231 times. I find its scope of usefulness wider than the others; no serious consequences are to be anticipated; Pregnancy & labour are not interfered with; & its results are better than those of any other operation for displacement. It can replace an Adams-Alexander's - that is, it is suitable for the simplest kind of pathological conditions; & is, with certain modifications, & the additions of supplementary operations, successful for the relief of a large number of cases associated with procidentia & increased bulk of the uterus, before the menopause; & is therefore suitable for the more complicated ones. Hence it is valuable for the majority of the intermediate cases between these extremes. My results showed the uterus fell back some one to one & a half inches from the abdominal wall, within the first month or two, (the patient being examined in the lithotomy position). And later observations, as far as bimanual examinations allowed one to judge, showed the uterus in much the same position, — with the exception of some of the heavy uteri, which I thought had fallen back. In the fear that the displacement might be likely to recur in <sup>such</sup> time, I began to look

for a modification for these cases; & my technique, finally resolved itself (for the heavier uteri) into one more nearly approximating Olshausen's than Gilliam's. But as I do not touch either the cornua or the Broad ligaments, I designate the modification, for want of a better name, a Short Gilliam's, referring to the shortness of the suspensory ligament, left.

My method is as follows:-

I just skirt the cornua, & the proximal ends of the loops to be taken up, lie immediately beyond them. A sufficiency of tissue, is drawn into the loop, to form a good grip on the muscular wall & fascia, & fixed.

I pay no attention to the amount of ligament left in the distal portion. To my mind, the looser the ligament is in its distal part, the better. As, if there be any fear of intestinal strangulation, which my own experience & the literature of the subject, lead me to doubt, this fear would be negatived to some extent, by its looseness; any piece of the intestine slipping in, being by its own vitality able to slip out again, providing the surrounding structures do not constrict it.

I do not limit myself to the suspension operation only. There are, I hold, four separate pathological conditions, to be noted in the more involved cases. (1). Increased

weight in the prolapsed organs. (2). The initial lesion generally the pelvic floor, with the depth of damage.

(3). Loss of adjustment in the supporting structures.

(4). Downward dislocation. I meet the first by a preliminary curettage, lavage & tamponage; amputation of the Cervix if indicated, & the choice of a suitable date (midway between the two menstrual periods), for operating. For the other factors, I do the colporrhaphies, & the Levator Ani Suturing, if required.

I have operated by this method 54 times, for cases associated with increase and irreducible uterine bulk or procidentia. (Where there is cystocele with these cases, I perform an anterior colporrhaphy, by a transverse clasping, instead of a longitudinal one).

15 of these, & 16 of the ordinary Gilliams, I have had under observation for periods of 6 months to two years, & in both classes, the position finally assumed by the uterus, as a rule, is what I have recorded before. That is, where no stretching of the ligaments had taken place before the two months were up, there appeared to be no tendency for it to take place later. And with the exception of one or two, where the ordinary Gilliam's had been done for very heavy uteri, there was none. My record of results are of course small, & the period of obser-

vation, short; but unfortunately, a double transfer from Hospital to Hospital in four years, prevented me from keeping in touch with them longer. And there are no facilities in India, for carrying on observations after leaving a place, unless Government supports one. Four of these cases became pregnant, & were said to have been delivered naturally. One other case aborted- possibly placenta praevia.

If my theory that the Round Ligaments are valuable in forming a fixed point, against uterine contractions in labour, be correct, labour would tend to be retarded by the Gilliam's Operation; as the Round Ligaments, by their new attachments are held in a yielding muscular wall, instead of a firm one, & their traction also would be direct, instead of over the pull of the Internal Abdominal Ring.

# WORK ON THE BROAD LIGAMENTS.

The best-known work on these, has been done by Inglis

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Parsons, although it can hardly be called operative.

He injects a solution of quinine into the bases of the Broad Ligaments, midway between the Cervix & lateral pelvic attachments, on either side to produce a bilateral fibrosis. His solution consists of 12 grains of quinine, with 30 minims each of dilute sulphuric acid, & distilled water. A single injection, he says, is sufficient, as a rule, but it can be repeated in a fortnight if necessary. The results, he gives, are 75 per cent in which the uterus is permanently kept in position, 2 per cent are improved, & 5 per cent failed.

Personal Experience. I have had none. To me, it appears difficult to determine the "permanent" results of such a wide-spread fibrosis as this must bring about, in the neighbourhood of so rich a blood-supply. Again, fibrous tissue, with a permanent strain on it, will tend to relax.

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LAWSON TAIT & IMLACH both recommended shortening the



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Broad ligaments. Sanger ~~1/44~~ tried fixing the uterus by stitching them longitudinally near the fundus to the

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abdominal wall. Olshausen did the same, but generally associated with another attachment. In 1903, Alexan-

1/48

androff recorded an operation, in which through a posterior colpotomy, he brought the bases of the Broad Ligaments round to the front of the cervix & stitched them there.

From the lack of muscular tissue in the upper part of the Broad Ligaments, the last mentioned operation is the only one likely to be of any good. Sanger's & Olshausen's would probably only be so in proportion to the lateral fundal attachment, which would be likely to result.

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WORK ON THE UTERO-SACRAL LIGAMENTS.

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Schultze, with his belief that 90 per cent of all retro-displacements were caused by the relaxation of the Folds of Douglas, suggested shortening the Utero-sacral ligaments.

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In 1888, & 1889, Byford, Freund & Sanger shortened them

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through the vagina. Wertheim & Mundt in 1896, did the

double operation of shortening the Round Ligaments as

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well, as did Stanmore Bishop later. From then on, Polk,

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Noble, Bovee & Stanmore Bishop have constantly done the

operation either by the vagina or intra-abdominal method.

By the vaginal route- a dissection through ~~the~~<sup>a</sup> posterior colpotomy, exposes the Utero-sacral ligaments, which are hooked down & stitched to the back of the Uterus. The incision is closed by an approximation of the upper & lower angles of the incision, & a transverse suturing. By the abdominal route- the uterus is pulled well forward, & a fold taken in the lowest part of the ligament. One or more stitches are placed above to correct the bulging. Noble reports that there are no good results from it. It may be useful where ~~the~~ a general tightening up is required, along with other operations.

<sup>1.59</sup>  
JELLETT claims to be the originator of a technique for shortening them extra-peritoneally. His method is the following :-

The mucous membrane on the posterior part of the cervix to be cut & pushed up. On pulling forward the cervix the utero-sacral ligaments can be seen or felt, & these are to be cut near their insertion to the cervix, brought round encircling it, & fastened to it, in front. A part may be excised if too long. He quotes success in 20 cases. Wertheim's method is somewhat similar, but through an anterior colpotomy.

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## SECTION 4. Part 2.

## SUPPLEMENTARY OPERATIONS.

Present-day technique recognises the value of combining operations, such as Curettage, Amputation of the Cervix, & Repair of the pelvic floor, along with the more important ones of fixations & suspensions. The present epoch cannot, however, lay claim to its introduction. Baumgartner<sup>1</sup> appears to have been the first to report the procedure, in 1876; & of the second epoch surgeons, who have recorded it as a systematic routine, are Doleris,<sup>2</sup> Munde,<sup>3</sup> Küstner<sup>4</sup> & Pozzi,<sup>5</sup> in '86 to '88. As the combined method is accepted almost universally, & has been referred to often in the foregoing pages, with regard to the various factors involved in uterine support, its position need not be discussed further, here. Scott<sup>6</sup> has suggested the main & the supplementary operations being done at the same time.

The Supplementary operations are ones, which, of little value by themselves, form useful, & often necessary adjuncts to the main operations of fixations & suspensions. Their objects are to correct the various pathological conditions which are associated with uterine prolapse, or displacement. They include the Vaginal plastics, Union of the Levator Ani muscles, Harris' suturing of

the Psoas Parvus to the back of the Uterus, Transplan-  
 tation of the muscular tissue from the Gluteus Maximus  
 by Tandler & Halbein. <sup>1/8</sup> (only performed on the cadaver,  
 as yet.) Injections of paraffine into the submucosa of  
 the lower vagina, Doubling of the vaginal wall & rendering  
 it tube-like, by Reich of Altona, <sup>1/9</sup> Curettage & Amputation  
 of the Cervix.

Of these, the only ones requiring consideration are the  
 Colporrhaphies, Levator Ani Suturing, Curettage & Ampu-  
 tation of the Cervix: the others being merely surgical  
 curiosities.

An ANTERIOR COLPORRHAPHY is a resection of the anterior  
 vaginal wall for cystocele. The usual method is ~~to~~ to  
 make an elliptical excision of the mucous membrane over  
 the cystocele. My own method, followed in over 400  
 cases, is to clamp a suitable amount of the mucous mem-  
 brane in large forceps, transfix the tissue some quarter  
 of an inch behind the forceps, ~~transfix~~ on their prox-  
 imal side, by needles threaded with silkworm-gut, & ex-  
 cise the superfluous tissue by snipping it between the  
 forceps & needles; then, removing the forceps along  
 with the dissected tissue, to pull the needles through  
 & tie the sutures. The value of the operation lies in

several points- there is no bleeding, as the vessels are constricted, & the tissues, once clamped, remain in apposition long enough to allow the suturing to be fastened without gaping; whereas in an elliptical excision, there is delay from free oozing, & less chance of healing by first intention. The fear of injuring the bladder is rendered remote, as the clamping has gathered the submucosa into a thick bank, behind which the bladder wall recedes from the site of work; & moreover, a sound passed into the bladder before the withdrawal of the needles, will easily appreciate a needle, if it has entered the bladder; whereas a stitch might be overlooked by it. It is also a very quick method of working- a point of some value where several operations have to be done at one sitting.

7-10

DUDLEY'S operation, where there is dribbling of urine, accompanying a cystocele, consists in a horse-shoe resection of the anterior vaginal wall - the centre of the horse-shoe including the tissue between the clitoris & the urethral orifice.

THE POSTERIOR COLPORRHAPHIES have varied but slightly from the days when their technique was established by Hegar, Martin & others, in 1880, to 1890. Two principles

govern this operation: - one, the resection of a median portion of vaginal mucous membrane from over the rectum; & the other, the preservation of that piece of tissue, with lateral resections. The object of the former is to remove the more lax part of the tissue, & produce a firm cicatricial band in its place; of the latter, to retain the posterior column of the vagina, which, according to Freund, is of great value, owing to its power of resistance to intra-abdominal pressure. The former method has been established chiefly by Hegar.

12  
HEGAR dissects off a piece of triangular mucous membrane with the base flush with the skin, from the median part of the posterior vaginal wall. The sides of the denuded portion are approximated, & sutured - the sutures including the muscular tissue of the perineum.

13  
LAWSON TAIT'S operation consists in splitting the recto-vaginal septum with scissors, & dissecting laterally, raising the flap of tissue thus obtained. No tissue is removed, & the stitches are inserted at the sides & remain intra-muscular; they do not appear on the surface of the skin at all. It is a very neat operation, but has the disadvantage, that the large loose flap is apt to pocket, by the oozing of blood, & union is delayed.

<sup>/14</sup>  
 Lewers says he has found it advantageous to snip off the lower part of the flap. And I have often found it desirable to modify the operation in this way.

<sup>/15</sup>  
 A. MARTIN working on the second principle - that of preserving the posterior median column, makes two triangular denudations, one on either side of a strip of mucous membrane left intact over the rectum. The outer edge of each denudation is approximated with the border of the median strip of its own side.

<sup>/16</sup> <sup>/17</sup>  
 KELLY & EMMET work on Martin's principle, but free the median flap, which is triangular, <sup>apex down,</sup> Kelly claims for this operation, that by it the outlet is thrown forward & intra-abdominal pressure made to fall on the posterior vaginal wall. Noble approves of this method.

PERSONAL EXPERIENCE. For choice, & with an experience of over 1000 operations (both primary, in my early days, & supplementary, later), I prefer Hegar's or Lawson Tait's. If the dissection is wide & a large flap likely, I do a Hegar's. The Kelly-Emmets operation retains the over-stretched tissue, & although the shape of the vagina is <sup>main-</sup> retained by it, would tend to favour return of the rectocele.



The vaginal plastics fail as primary operations, because the cause of the distension at the outlet - that is the prolapsed & weighty organ, remains, & further dragging must ensue. Where the weight has been lifted off the parts by suspensions, & the only work required from them, is to correct the existing distension, they give favourable results.

REPAIR OF THE LEVATOR ANI. Work on the Levator Ani has been carried out largely by the American Gynaecologists, & the name of Holden<sup>18</sup> is specially associated with it. The principles are twofold:- to ~~reduce~~ restore a contractile floor to the pelvis: & to produce a wall in front of the rectum. The Levator Ani muscles are to be found, by the finger pressing down on the ischia, through a posterior colpotomy. The finger impinges on the Levator Ani, which can be hooked down. The essentials in technique are that the approximation of the two muscles must be broad, long, & continuous. The operation is simple; but it requires some judgment, as there should be no tension. Results are excellent: a good muscular control is established, & the intra-abdominal pressure is removed from the outlet.

## CURETTAGE.

Is valuable in that it puts the Uterus in a healthy condition, & reduces bulk where metritis accompanies displacement. Again, it is in itself, a cure to many displacements, due to sub-acute metrites. ( Compare Prof. Alfred Smith's reference to displacements righting themselves after the pathological condition is removed.)

## AMPUTATION OF THE CERVIX.

The ordinary method is the <sup>bi-</sup>conical ~~method~~ incision of Simon & Markwald, & is performed as follows:-

The Cervix is slit up at either side, & a wedge-shaped block of tissue is excised from each lip, the ~~top~~ base being below. The anterior & posterior surfaces of the wedge are approximated & sutured, & the lateral openings of the Cervix closed, as in a trachelorrhaphy.

<sup>121</sup> <sup>122</sup> HEGAR & KELLY make a circular amputation of the Cervix without lateral incisions- the denuded surface being cup-like.

<sup>123</sup> SCHROEDER removes the inner glandular part of the Cervix by a wedge-shaped excision. His operation is suitable for cases where there is much eversion of the Os. Simon-Markwald's gives the best results. Schroeder's,

in my experience, the least. This is also Noble's experience.

Amputation of the Cervix, is another operation, which has has shewn itself to be a cure for certain kinds of displacements. It acts both by removing a wedge of tissue, which travelling in the line of least resistance—that is towards the vaginal outlet—has the result of throwing back the fundus into a position of retroversion; & by reducing weight, both directly & indirectly—in directly, because the operation, invariably brings about a diminution in the size of the Uterus. This was noted as early as 1864,<sup>125</sup> is referred to later by Pozzi,<sup>126</sup> & is observed by clinicians of to-day.

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I have endeavoured, in this thesis, to bring into form & order, a subject which has been left in a chaotic state. I have traced it through 80 years of evolution from heroic beginnings, when surgeons worked in fear & trembling, to the present day; when Asepsis, Schools of Anatomy & Experimental Physiology, & records of earlier workers, have enabled us to form convictions, & to put away fear & work with the courage of our convictions. Not yet however are we entirely free from the taint of empiricism. The diverse results of the same series of operations in the hands of different surgeons are still to be explained, & the actual factor, on which depends the success or failure of a ligamentous operation, still to be enunciated.

To offer conclusions -

There are two methods of reducing uterine displacements - the one, by the direct attachment of the uterine body; & the other, by the indirect attachment through ligaments. To the former class, belong both the ventral & vaginal fixations; the general utility of which is lessened by the only safe period for their application being after the menopause, & for which the principle of the stronger the adhesion, the better the cure, may be taken broadly. Remains therefore, the ligamentous work, for the child-



-bearing period. And for all practical purposes, this is reduced to the Round Ligament Operations.

The Round Ligaments present distinct structural differences in their various parts. They are cone-shaped, the proximal ends being thickly muscular, & the distal almost entirely fibrous. Their route is circuititious- being intra-abdominal in one direction, & intra-inguinal & extra-abdominal in another. The intra- abdominal portion is muscular & more closely allied in structure to the uterus, than to the intra-inguinal portion. The proximal part of the intra-inguinal portion is transitional between the muscular part within the abdomen, & the fibrous part in the distal region. The function of the intra-abdominal portion is to contract & to elongate in response to the physiological movements of the uterus; the inguinal part is supporting, & has to ~~ve~~ support both the uterine fundus & the intra-abdominal part of the ligaments, in which effort it is aided by the presence of the Internal Abdominal Ring, over the inner pillar of which, it works as over a pulley. Muscular tissue is contractile, can recover tone, & is able to hypertrophy to meet a demand for more work. Fibrous tissue, once stretched, remains stretched. The crux of all Round Ligament Work, appears to me, to depend on the new attachments being made

to the CONTRACTILE PART OF THE LIGAMENT, & not to the fibrous, whether it is done at the External Inguinal Ring, or through an abdominal opening. The higher the cone, the more muscle there will be, with greater power of contractility & therefore greater capacity for work. Therefore an Adams-Alexanders is suitable for simple cases, a Gilliam's for the more complicated ones, & a Short Gilliams for the heavy ~~of~~ uteri—in the generality of cases.

The surgeon in Uterine -Displacement work, must have the eye & hand of an anatomist, the minute observation of a physiologist, the deductive power of a logician & the mechanical art of an engineer. Possibility the difficulty of one man possessing all these attributes, is accountable for the variability in the personal equation of different surgeons to the results of any one operation.

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